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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/982,317	10/18/2001	Arnab Das	129250-002120/US	6605
32498 7590 11/27/2007 CAPITOL PATENT & TRADEMARK LAW FIRM, PLLC P.O. BOX 1995 VIENNA, VA 22183			EXAMINER MERED, HABTE	
			ART UNIT 2616	PAPER NUMBER
			MAIL DATE 11/27/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/982,317

Applicant(s)

DAS ET AL.

Examiner

Habte Mered

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8,11-14 and 17-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8,11-14 and 17-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/18/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendment filed on 9/07/07 has been entered and fully considered.
2. Claims 1-6, 8, 11-14, and 17-19 are pending.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-5, 8, 11-14, and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry et al (US 6, 996, 082), hereinafter referred to as Terry, in view of Odenwalder et al (US 6, 804, 220), hereinafter referred to as Odenwalder.

Terry discloses a method and apparatus for allocating resources in hybrid TDMA communication Systems.

- 7A). Regarding **claim 1**, Terry discloses a method for transmitting information in a communication channel of a wireless communication system (**Figure 1, Column 6:25-35**), the method comprising: dividing the communication channel into a plurality of time slots of equal duration; (**See Figure 4 S1...S12 are timeslots and CDMA codes 0...15 defining the sub-slots as further illustrated in Column 2:60-67**) and sub-dividing, on other than a time division basis (**Sub-slots divided on the basis of CDMA codes**), each of the plurality of time slots to comprise two or more sub-slots (**In Figure 4 each time slot contains 16 sub-slots**), and transmitting at least one transmission, among a number of transmissions, that comprises a number of contiguous sub-slots associated

with at least two time slots, where the number of sub slots included in the transmission from each time slot may vary from time slot to time slot (**See Figure 15, each timeslot S1...S12 is sub-divided into 16 sub slots using code 0...15. It is clear from Figure 15 UE A for instance for a single transmission uses time slots 5, 6, and 7 and each time slot has different number of sub-slots. For instance UE A in time slot 5 uses 12 sub-slots and in time slot 6 uses 16 sub slots and in time slot 7 uses 3 sub slots. The transmission associated with UE C also adequately addresses this limitation)**

Terry, however, fails to expressly disclose a method of transmitting a separate control channel for each separate transmission, wherein the duration of the separating control channel is dependent upon the number of transmitted sub-slots.

Odenwalder teaches a method and apparatus for generating control information for packet data and sending it on a control channel useful for various applications including CDMA (See Column 4, Lines 13-23)

Odenwalder discloses a method of transmitting a separate control channel for each separate transmission, wherein the duration of the separating control channel is dependent upon the number of transmitted sub-slots. (**See Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-26)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Terry's method to incorporate a method of transmitting a separate control channel for each separate transmission, wherein the duration of the separating control channel is dependent upon the number of transmitted sub-slots. The

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motivation being such use of control channel technique reduces overhead and increases system resources for user data traffic since no additional new CDMA/Walsh codes will be needed to prevent interference in the different sub-slots associated with different transmission in the control channel which is further illustrated in Odenwalder in Column 1, Lines 53-67.

7B). Regarding **claim 14**, Terry discloses a method for transmitting information in a communication channel of a wireless communication system (**Figure 1, Column 6:25-35**), the method comprising: dividing the communication channel into a plurality of time slots of equal duration according to a time division multiple access scheme (**See Figure 4 S1...S12 are timeslots (TDMA system) and CDMA codes 0...15 defining the sub-slots as further illustrated in Column 2:60-67**) and sub-dividing each of the plurality of time slots to comprise two or more sub-slots according to CDMA scheme (**See Column 3:1-5**); transmitting at least one transmission, among a number of transmissions, that comprises a number of contiguous sub-slots associated with at least two time slots, where the number of sub slots included in the transmission from each time slot may vary from time slot to time slot. (**See Figure 15, each timeslot S1...S12 is sub-divided into 16 sub slots using code 0...15. It is clear from Figure 15 UE A for instance for a single transmission uses time slots 5, 6, and 7 and each time slot has different number of sub-slots. For instance UE A in time slot 5 uses 12 sub-slots and in time slot 6 uses 16 sub slots and in time slot 7 uses 3 sub slots. The transmission associated with UE C also adequately addresses this limitation**)

Terry, however, fails to expressly disclose a method of transmitting a separate control channel for each separate transmission, wherein the duration of the separating control channel is dependent upon the number of transmitted sub-slots.

Odenwalder discloses a method of transmitting a separate control channel for each separate transmission, wherein the duration of the separating control channel is dependent upon the number of transmitted sub-slots. **(See Column 5, Lines 60-67; Column 6, Lines 9-20 and 21-26)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Terry's method to incorporate a method of transmitting a separate control channel for each separate transmission, wherein the duration of the separating control channel is dependent upon the number of transmitted sub-slots. The motivation being such use of control channel technique reduces overhead and increases system resources for user data traffic since no additional new CDMA/Walsh codes will be needed to prevent interference in the different sub-slots associated with different transmission in the control channel which is further illustrated in Odenwalder in Column 1, Lines 53-67.

8. Regarding **claims 2**, Terry discloses a method, wherein each of the two or more contiguous sub-slots is separately transmitted according to a code division multiple access schemes. **(See Columns 2:64-67 and 3:1-10)**

9. Regarding **claim 3**, Terry discloses a method wherein, in any one of the plurality of time slots, each of a plurality of transmissions are separately coded and carried in a separate sub-slot simultaneously in such time slot. **(See Columns 2:64-67 and 3:1-10)**

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10. Regarding **claim 4**, Terry discloses a method wherein each of the plurality of transmissions corresponds to a separate user of the wireless communication system.

(See Figures 4-10, UE A, UE B, UE C are separate users. See Columns 2:64-67 and 3:1-10)

11. Regarding **claim 5**, Terry discloses a method wherein each off the plurality of transmissions corresponds to separate transmissions of a single user of the wireless communication system. **(See Figures 4-10, UE A, UE B, UE C are separate users with multiple sub-slots transmission. See Columns 2:64-67 and 3:1-10)**

12. Regarding **claim 8**, Terry discloses a method, wherein the communication channel comprises time slots each having duration of 1.25 milliseconds and wherein each of the time slots comprises at least two sub-slots. **(Terry discloses in Figure 5B and further on Column 6, Lines 39-43 that each time slot can have several sub-channels. There is no restriction imposed on the duration of the time slot and can readily be 1.25 milliseconds and 1.25 millisecond duration is standard for TDMA systems.)**

13. Regarding **claim 11**, Terry discloses all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method wherein the communication channel is a forward packet data channel (F-PDCH), wherein information is transmitted as encoder packets in the forward packet data channel (F-PDCH), and wherein the separate control channel is a forward secondary packet data control channel (SPDCCH).

Odenwalder discloses a method wherein the communication channel is a forward packet data channel (F-PDCH), wherein information is transmitted as encoder packets in the forward packet data channel (F-PDCH), and wherein the separate control channel is a forward secondary packet data control channel (SPDCCH). **(See Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-35)**

14. Regarding **claim 12**, Terry teaches all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein the forward secondary packet data control channel (SPDCCH) includes:

- a sub-slot start field for identifying a sub-slot within a time slot in which a particular transmission starts; and

- a sub-slot count field for identifying the total number of sub-slots that carry the particular transmission.

Odenwalder discloses a method, wherein the forward secondary packet data control channel (SPDCCH) includes:

- a sub-slot start field for identifying a sub-slot within a time slot in which a particular transmission starts; and

- a sub-slot count field for identifying the total number of sub-slots that carry the particular transmission. **(Odenwalder's system has to have a sub-slot count and start fields because it has to convey to the end user the number of sub-slots assigned to the user and where the number of sub-slots are and this particular inherency is chronicled in Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-35.)**

15. Regarding **claim 13**, Terry teaches all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein a plurality of forward secondary packet data control channels (SPDCCH) correspond to a plurality of simultaneous transmissions on the forward packet data channel (F-PDCH), and wherein each of the plurality of secondary packet data control channels (SPDCCH) identifies a sub-slot start position within a time slot in which a particular transmission starts.

Odenwalder discloses a method, wherein a plurality of forward secondary packet data control channels (SPDCCH) correspond to a plurality of simultaneous transmissions on the forward packet data channel (F-PDCH), and wherein each of the plurality of secondary packet data control channels (SPDCCH) identifies a sub-slot start position within a time slot in which a particular transmission starts. **(Odenwalder's system has to have a sub-slot count and start fields because it has to convey to the end user the number of sub-slots assigned to the user and the nature of this inherency is chronicled in Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-35.)**

16. With respect to **claims 11-13**, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Terry's method by including a forward packet data channel (F-PDCH), a forward secondary packet data control channel (SPDCCH), wherein the forward secondary packet data control channel (SPDCCH) includes a sub-slot count and start fields. The motivation being such use of control channel technique reduces overhead and increases system resources for user data traffic since no additional new CDMA/Walsh codes will be needed to prevent

interference in the different sub-slots associated with different transmission in the control channel which is further illustrated in Odenwalder in Column 1, Lines 53-67.

17. Regarding **claim 17**, Terry discloses a method, wherein bandwidth in the communication channel is allocated on a fractional basis to carry a plurality of transmissions using a combination of a variable number of contiguous sub-slots and a variable number of contiguous time slots. **(See Figures 4-8 and 13, See Columns 2:64-67 and 3:1-10)**

18. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Terry in view of Odenwalder as applied to claim 1 above, and further in view of Toskala et al (US 6, 535, 503).

The combination of Terry and Odenwalder, teach all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein each of the two or more sub-slots within a particular time slot corresponds to a different frequency according to a frequency division multiple access (FDMA) scheme.

Toskala like Terry discloses a method and apparatus for allocating resources in hybrid TDMA communication Systems. The hybrid TDMA system primarily described by both Toskala and Terry is TDMA/CDMA.

Toskala shows that TDMA/FDMA is feasible and further discloses a method, wherein each of the two or more sub-slots within a particular time slot corresponds to a different frequency according to a frequency division multiple access (FDMA) schemes. **(See Column 1, Lines 40-50)**

It would have been obvious to one of ordinary skill in the art at the time of invention to practice FDMA/TDMA access in the combination of Terry's and Odenwalder's method wherein each of the two or more sub-slots within a particular time slot corresponds to a different frequency according to a frequency division multiple access (FDMA) schemes. One is motivated to use TDMA/FDMA in GSM systems as it is widely used in the international wireless market and GSM access method is based on both FDMA and TDMA.

19. **Claims 18 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry in view of Odenwalder as applied to claim 1 above, and further in view of Malkamaki et al (US 5, 577, 024); hereinafter referred to as Malkamaki.

20. Regarding **claim 18**, the combination of Koorapaty and Odenwalder, teach all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method wherein transmissions within the communication channel include two or more transmissions selected from the group consisting of new transmissions, retransmissions, acknowledgements (ACKs), negative acknowledgements (NACKs), and multi-level ACK/NACK messages.

Malkamaki discloses a TDMA/CDMA system similar to Koorapaty but further incorporates Automatic Repeat request (ARQ) transmission scheme.

Malkamaki discloses a method wherein transmissions within the communication channel include two or more transmissions selected from the group consisting of new transmissions, retransmissions, acknowledgements (ACKs), negative acknowledgements (NACKs), and multi-level ACK/NACK messages. **(See Column 1,**

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Lines 19-35; Column 3, Lines 65-67; and Column 4, Lines 1-17; Since Malkamaki's system supports ARQ and also like Koorapaty's system allows sub-slots in a given time slot, it is possible to have 4 users sharing the time slot. Each user in the sub-slot can be sending new transmission, Acks, Nacks and multi-level ACK/NACK).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combination of Terry's and Odenwalder's method to incorporate orthogonal ARQ transmission, the motivation being implementing an error correction system for users in a TDMA/CDMA system.

21. Regarding **claim 19**, the combination of Terry and Odenwalder, teach all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein a multi-level ACK/NACK message corresponds to multiple transmissions that end within the same time slot.

Malkamaki discloses disclose a method, wherein a multi-level ACK/NACK message corresponds to multiple transmissions that end within the same time slot. **(See Column 1, Lines 19-35; Column 3, Lines 65-67; and Column 4, Lines 1-17; Malkamaki's system supports ARQ in an environment where multiple transmission within the same environment is allowed.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combination of Terry's and Odenwalder's method to incorporate orthogonal ARQ transmission, the motivation being implementing an error correction system for users in a TDMA/CDMA system.

Response to Arguments

22. Applicant's arguments filed on 9/7/2007 have been fully considered but they are not persuasive.

23. In the Remarks, on page 6, in the second and third paragraphs, Applicant argues with respect to claims 1 and 14, the combination of Terry and Odenwalder, based on what the Examiner has cited in the previous action, fails to teach the newly amended limitation in the independent claims that requires transmitting at least one transmission, among a number of transmissions, that comprises a number of contiguous sub-slots associated with at least two time slots, where the number of sub slots included in the transmission from each time slot may vary from time slot to time slot. Applicant indicated the previously cited Figure 8 specifically failed to teach the limitation because for a given transmission the same number of sub slots is used from time slot to time slot.

Examiner respectfully disagrees with Applicant's conclusions. Examiner cited Figure 8 while addressing a completely different version of the limitation in a previous Office Action. Now that the Applicant has amended independent claims 1 and 14 to basically require the number of sub slots included in the transmission from each time slot may vary from time slot to time slot, after carefully reviewing the Primary Reference, Terry, it is still the position of the Examiner that Terry adequately teaches the amended

limitation as illustrated in Figure 15. Hence given this fact Examiner is still maintaining the 103 rejections of all independent claims and pending dependent claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

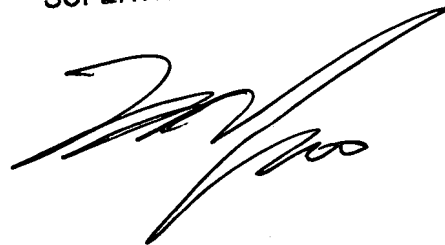
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris H. To can be reached on 571 272 7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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HM
11-24-2007

KWANG BIN YAO
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read 'Kwang Bin Yao', is written over the printed name and title.